APPENDIX

my_bin_khs.c

```
#include <stdio.h>
#include <string.h>
#include <stdlib.h>

char fname[]="transkrip.txt";
int loop = 1;
int ukuran_htable = 100;


struct htable{
    char nim[12];
    char nm_mhs[100];
    char thn_ajar[20];
    char kd_msuji[50];
    char kd_puskom[50];
    char nama_mtk[100];
    char nilai[3];
    char bintang;
    int sks;
    struct htable *root;
    struct htable *detail;
};
typedef struct htable data;

data *head[100],*kursor,*baru,*first;

void input_data();
void input_hash_table(int index,int nim);
void cetak_htable();
void mtk_ulang();
void insertion(int index);
void cetak_insertion(int index);

float hitung_nilai(char *nilai);
int ubah_nim ( char * nim );

void menu();
void pilihan_1(char * nim);
void pilihan_2(char * nim);
void pilihan_3(char * nim);
void pilihan_4(char * nim, char *tahun, char *kd_msuji);
void pilihan_5(int angkatan);
```

```
int main (){
  input_data();
  cetak_htable();
  while(loop)
  {
     menu();
  }
```

```
return 0;
}
```

```
int ubah_nim ( char * nim )
{
     char angkatan[3], cnim[5];
int total_nim;

angkatan[0] = nim[0];
angkatan[1] = nim[1];
angkatan[2] = '\0';

cnim[0] = nim[6];
cnim[1] = nim[7];
cnim[2] = nim[8];
cnim[3] = nim[9];
cnim[4] = '\0';

total_nim = atoi(angkatan) * 10000 + atoi(cnim);
return total_nim;
}
```

```
void input_data(){

 char separator;
 int index, inim;
 FILE *fp;

  if(!(fp=fopen(fname,"r"))) {
    printf("Cannot open file '%s' !\n",fname);
    return;
  }

  while (!feof(fp)) {
    baru=(data *)malloc(sizeof(data));

    fscanf(fp,"%[^|]",baru->nim);
     fscanf(fp, "%c", &separator);
    fscanf(fp,"%[^|]",baru->nm_mhs);
     fscanf(fp, "%c", &separator);
    fscanf(fp,"%[^|]",baru->thn_ajar);
     fscanf(fp, "%c", &separator);
    fscanf(fp,"%[^|]",baru->kd_msuji);
     fscanf(fp, "%c", &separator);
    fscanf(fp,"%[^|]",baru->kd_puskom);
     fscanf(fp, "%c", &separator);
    fscanf(fp,"%[^|]",baru->nama_mtk);
     fscanf(fp, "%c", &separator);
    fscanf(fp,"%[^|]",baru->nilai);
     fscanf(fp, "%c", &separator);
    fscanf(fp,"%d",&baru->sks);
     fscanf(fp, "%[^\n]", &separator);
    fscanf(fp, "%c", &separator);
    baru->bintang = '*';
    baru->root = NULL;
```

```
    baru->detail = NULL;

    if(!feof(fp))
    {
        inim  = ubah_nim( baru->nim );
        index = inim % 100;
            input_hash_table(index, inim);
    }
  }
fclose(fp);
}
```

```
void mtk_ulang(){
    float nilai_baru, nilai_kursor;

    nilai_baru = hitung_nilai(baru->nilai);

    while(kursor != NULL) {
        nilai_kursor = hitung_nilai(kursor->nilai);
        if(strcmp(baru->kd_puskom,kursor->kd_puskom) == 0){

            if(nilai_kursor > nilai_baru){
                baru->bintang = '\0';
            }else{
                kursor->bintang = '\0';
            }
        }
        kursor=kursor->detail;
    }
}
```

```
void insertion(int index){
    data *bantu;
    float nilai_baru, nilai_kursor;

    nilai_baru = hitung_nilai(baru->nilai);
    bantu = kursor;
    while(kursor != NULL) {
    cetak_insertion(index);

       nilai_kursor = hitung_nilai(kursor->nilai);

       if(nilai_baru > nilai_kursor){
            if(bantu == kursor)
            {
                if(first != NULL)
                   first->root = baru;

                baru->root=kursor->root;
                baru->detail=kursor;
                      cetak_insertion(index);

                if(kursor == head[index] )
                {
                    head[index] = baru;
                    kursor->root = NULL;
                }
```

```
                return;
            }
            else{
                bantu->detail=baru;
                baru->detail=kursor;
                      cetak_insertion(index);

                return;
            }
        }

        if(bantu != kursor)
        {
            bantu=bantu->detail;
        }
        kursor=kursor->detail;
    }
    bantu->detail = baru;
    kursor = baru;
    cetak_insertion(index);

}
```

```
void input_hash_table(int index,int nim){
    data *bantu;
    int inim;

    if(head[index] == NULL){
        head[index] = baru;
    }
    else{
        kursor = head[index];
        first = NULL;
        inim = ubah_nim( kursor->nim );
        while(kursor->root != NULL && inim != nim) {
            first = kursor;
            kursor=kursor->root;
            inim = ubah_nim( kursor->nim );
        }

        if(inim == nim)
        {
            bantu = kursor;
            mtk_ulang();
            kursor = bantu;
                  printf(".....insertion.....\n");

                  insertion(index);

        }
        else
        {
            kursor->root = baru;
        }
    }
}
```

```
void cetak_htable(){
    data *daftar;
    int i;
    printf("\n===============hash table====================\n");
    for(i=0;i<100;i++){
        kursor = head[i];
        printf("index %d\n ",i);
        while(kursor != NULL) {
           printf("(%s) -> ",kursor->nim);
           printf("(%s,%s,%c) -> ",kursor->nama_mtk,kursor-
>nilai,kursor->bintang);
       daftar = kursor->detail;
       while(daftar != NULL) {
           printf("(%s,%s,%c) -> ",daftar->nama_mtk,daftar-
>nilai,daftar->bintang);
       daftar=daftar->detail;
            }
            printf("\n   | \n ");
            kursor=kursor->root;
        }
    }
}
```

```
void cetak_insertion(int index){
    data *daftar, *bantu;

    bantu = head[index];

    while(bantu != NULL) {
        printf("(%s) -> ",bantu->nim);
        printf("(%s,%s,%c) -> ",bantu->nama_mtk,bantu-
>nilai,bantu->bintang);
        daftar = bantu->detail;
        while(daftar != NULL) {
            printf("(%s,%s,%c) -> ",daftar->nama_mtk,daftar-
>nilai,daftar->bintang);
            daftar=daftar->detail;
        }
        printf("\n   | \n ");
        bantu=bantu->root;
    }
}
```

```
float hitung_nilai(char *nilai){
    float skor;

    if(strcmp(nilai,"A")==0){ skor = 4; }
    if(strcmp(nilai,"AB")==0){ skor = 3.5; }
    if(strcmp(nilai,"B")==0){ skor = 3; }
    if(strcmp(nilai,"BC")==0){ skor = 2.5; }
    if(strcmp(nilai,"C")==0){ skor = 2; }
    if(strcmp(nilai,"CD")==0){ skor = 1.5; }
    if(strcmp(nilai,"D")==0){ skor = 1; }
    if(strcmp(nilai,"DE")==0){ skor = 0.5; }
    if(strcmp(nilai,"E")==0){ skor = 0; }
```

```
    return skor;
}
```

```
void menu(){
    int nomer,angkatan;
    char nim[12];
    char tahun[20];
    char kd_msuji[50];
    char kode[50];
    char uji[50];

    printf("_____\n");
    printf("1. Transkrip biasa (lap akademik) \n");
    printf("2. Transkrip kapki \n");
    printf("3. Daftar Matakuliah tiap mahasiswa\n");
    printf("4. KHS\n");
    printf("5. IPK rata - rata per angkatan\n");
    printf("6. Keluar\n");
    printf("Nomer pilihan menu: ");
    scanf("%d",&nomer);
    switch(nomer){
        case 1 : printf("Masukkan nim: ");
                 scanf("%s",nim);
                 scanf("%*c");
                 pilihan_1(nim);
                 break;
        case 2 : printf("Masukkan nim: ");
                  scanf("%s",nim);
                 scanf("%*c");
                 pilihan_2(nim);
                break;
        case 3 : printf("Masukkan nim: ");
                 scanf("%s",nim);
                 scanf("%*c");
                 pilihan_3(nim);
                 break;
        case 4 : printf("Masukkan nim: ");
                  scanf("%s",nim);
                 scanf("%*c");
                  printf("Tahun ajaran: ");
                 scanf("%s",tahun);
                 scanf("%*c");
                   printf("G1/G2: ");
                 scanf("%s",kd_msuji);
                 scanf("%*c");
                 pilihan_4(nim, tahun, kd_msuji);
                 break;

        case 5 : printf("Masukkan angkatan: ");
                 scanf("%d",&angkatan);
                 pilihan_5(angkatan);
                 break;
        case 6 : loop = 0;
              break;
    }
}
```

```
void pilihan_1(char * nim){

    int index, angkatan, no, ip, inim;
    float ipk, total_ip, total_sks;
    char skripsi[50];

    no = 0;
    ip = 0;
    ipk = 0;
    total_ip  = 0;
    total_sks = 0;
    inim  = ubah_nim( nim );
    index = inim % 100;
    kursor= head[index];

    while(kursor != NULL) {
        if(strcmp(kursor->nim,nim) == 0){
            break;
        }
        kursor = kursor->root;
    }
    if(strcmp(kursor->nim,nim) != 0){
        return;
    }

    strcpy(skripsi,"");
    printf("_____
_____\n");
    printf(" %50s \n","HASIL STUDI KUMULATIF");
    printf("_____
_____\n");
    printf("%-14s : %s\n","NIM",nim);
    printf("Nama Mahasiswa : %s\n",kursor->nm_mhs);
    printf("_____
_____\n");
    printf(" %3s | %-15s | %-25s | %-3s | %-5s | %5s|
\n","NO","KODE MATAKULIAH","NAMA MATAKULIAH","SKS","NILAI","BOBOT
X SKS");
    printf("_____
_____\n");


    while(kursor != NULL) {
        if(kursor->bintang == '*'){
            no = no + 1;
            ip = hitung_nilai(kursor->nilai) * kursor->sks;
            total_ip = total_ip + ip;
            total_sks = total_sks + kursor->sks;
    printf("| %2d | %-15s | %-25s | %-3d | %-5s | %10d |
\n",no,kursor->kd_puskom,kursor->nama_mtk,kursor->sks,kursor-
>nilai,ip);
       }
       kursor=kursor->detail;
    }
    ipk = total_ip / total_sks;
    printf("_____
_____\n");
```

```
    printf("| %-48s | %-11.0f |%11.0f |
\n","JUMLAH",total_sks,total_ip);
    printf("_____________________________________________________________
_____________________\n");
    printf("| INDEX PRESTASI KUMULATIF : %-40.2f|\n",ipk);
    printf("_____________________________________________________________
_____________________\n");
    printf("| JUDUL SKRIPSI / TA       : %-40s|\n",skripsi);
    printf("_____________________________________________________________
_____________________\n");
}

void pilihan_2(char * nim){

    int index, angkatan, no, ip, inim;
    float ipk, total_ip, total_sks;
    char skripsi[50];

    no = 0;
    ip = 0;
    ipk = 0;
    total_ip  = 0;
    total_sks = 0;
    inim  = ubah_nim( nim );
    index = inim % 100;
    kursor= head[index];

     while(kursor != NULL) {
         if(strcmp(kursor->nim,nim) == 0){
             break;
         }
         kursor = kursor->root;
    }
    if(strcmp(kursor->nim,nim) != 0){
        return;
    }

    strcpy(skripsi,"");
    printf("_____________________________________________________________
_____________________\n");
    printf(" %50s \n","HASIL STUDI KUMULATIF");
    printf("_____________________________________________________________
_____________________\n");
    printf("%-14s : %s\n","NIM",kursor->nim);
    printf("Nama Mahasiswa : %s\n",kursor->nm_mhs);
    printf("_____________________________________________________________
_____________________\n");
    printf(" %3s | %-15s | %-25s | %-3s | %-5s | %5s|
\n","NO","KODE MATAKULIAH","NAMA MATAKULIAH","SKS","NILAI","BOBOT
X SKS");
    printf("_____________________________________________________________
_____________________\n");

    while(kursor != NULL) {
        if(kursor->bintang == '*' && total_sks < 90){
            no = no + 1;
            ip = hitung_nilai(kursor->nilai) * kursor->sks;
            total_ip = total_ip + ip;
```

```
            total_sks = total_sks + kursor->sks;
    printf("| %2d | %-15s | %-25s | %-3d | %-5s | %10d |
\n",no,kursor->kd_puskom,kursor->nama_mtk,kursor->sks,kursor-
>nilai,ip);
       }
       kursor=kursor->detail;
    }
    ipk = total_ip / total_sks;
    printf("_____________________________________________________________
_____________________\n");
    printf("| %-48s | %-11.0f |%11.0f |
\n","JUMLAH",total_sks,total_ip);
    printf("_____________________________________________________________
_____________________\n");
    printf("| INDEX PRESTASI KUMULATIF : %-40.2f|\n",ipk);
    printf("_____________________________________________________________
_____________________\n");
    printf("| JUDUL SKRIPSI / TA       : %-40s|\n",skripsi);
    printf("_____________________________________________________________
_____________________\n");
}
```

```
void pilihan_3(char * nim){
    int index, angkatan, no, inim;
    float ipk;
    char nol[2],nol2[4];

    no = 0;
    inim  = ubah_nim( nim );
    index = inim % 100;
    kursor= head[index];

    while(kursor != NULL) {
         if(strcmp(kursor->nim,nim) == 0){
            break;
         }
         kursor = kursor->root;
    }
    if(strcmp(kursor->nim,nim) != 0){
         return;
    }

    printf("_____________________________________________________\n
");
    printf(" %35s \n","DAFTAR MATA KULIAH");
    printf("_____________________________________________________\n
");
    printf("%-14s : %s\n","NIM",kursor->nim);
    printf("Nama Mahasiswa : %s\n",kursor->nm_mhs);
    printf("_____________________________________________________\n
");
    printf(" %3s | %-15s | %-25s |\n","NO","KODE MATAKULIAH","NAMA
MATAKULIAH");
    printf("_____________________________________________________\n
");

    while(kursor != NULL) {
        if(kursor->bintang == '*'){
```

```
            no = no + 1;
            printf("| %2d | %-15s | %-25s |\n",no,kursor-
>kd_puskom,kursor->nama_mtk);
        }
        kursor=kursor->detail;
    }
    printf("_____________________________________________________\n
");
}
```

```
void pilihan_4(char * nim, char *tahun, char *kd_msuji){
    data *kursor;
    int index, angkatan, no, ip, inim;
    float ipk, total_ip, total_sks;
    char nol[2],nol2[4];

    no = 0;
    ip = 0;
    ipk = 0;
    total_ip  = 0;
    total_sks = 0;
    inim  = ubah_nim( nim );
    index = inim % 100;
    kursor= head[index];

   while(kursor != NULL) {
        if(strcmp(kursor->nim,nim) == 0){
            break;
        }
        kursor = kursor->root;
    }
    if(strcmp(kursor->nim,nim) != 0){
        return;
    }

    printf("_____________________________________________________
_____________________\n");
    printf(" %50s \n","KARTU HASIL STUDI");
    printf(" %44s \n","(KHS)");
    printf("_____________________________________________________
_____________________\n");
    printf("%-14s : %s\n","NIM",kursor->nim);
    printf("Nama Mahasiswa : %s\n",kursor->nm_mhs);
    printf("_____________________________________________________
_____________________\n");
    printf(" %3s | %-15s | %-25s | %-3s | %-5s | %5s|
\n","NO","KODE MATAKULIAH","NAMA MATAKULIAH","SKS","NILAI","BOBOT
X SKS");
    printf("_____________________________________________________
_____________________\n");

  while(kursor != NULL) {
       if(strcmp(kursor->thn_ajar, tahun) == 0 && strcmp(kursor-
>kd_msuji, kd_msuji) == 0){
            no = no + 1;
```

```
            ip = hitung_nilai(kursor->nilai) * kursor->sks;
            total_ip = total_ip + ip;
            total_sks = total_sks + kursor->sks;
        printf("| %2d | %-15s | %-25s | %-3d | %-5s | %10d |
\n",no,kursor->kd_puskom,kursor->nama_mtk,kursor->sks,kursor-
>nilai,ip);
        }
      kursor=kursor->detail;
    }
    ipk = total_ip / total_sks;
    printf("_____
_____\n");
    printf("| %-48s | %-11.0f |%11.0f |
\n","JUMLAH",total_sks,total_ip);
    printf("_____
_____\n");
    printf("| INDEX PRESTASI: %-40.2f|\n",ipk);
    printf("_____
_____\n");
}
```

```
void pilihan_5(int angkatan){
    data *kursor, *daftar;
    int i, no, no_angkatan, ip, index, inim;
    float ipk,ipk_rata2,total_ipk, total_ip, total_sks, total_mhs;

    no = 0;
    ip = 0;
    ipk = 0;
    total_ip  = 0;
    total_sks = 0;
    total_ipk = 0;
    total_mhs = 0;
    ipk_rata2 = 0;

    printf("_____
___\n");
    printf("\t \tIPK RATA-RATA ANGKATAN %d\n",angkatan);
    printf("_____
___\n");
    printf("| NO | %-3s %-5s  | %10s %-17s |  IPK |\n"," ","NIM","
","NAMA");
    printf("_____
___\n");

    angkatan = angkatan % 2000;

    for(i=0;i<ukuran_htable;i++){
        kursor = head[i];
        while(kursor != NULL) {
            inim  = ubah_nim( kursor->nim  );

            no_angkatan = inim / 10000;

            if(no_angkatan == angkatan)
            {
                daftar = kursor;
```

```
                ipk = 0;
                total_ip  = 0;
                total_sks = 0;

                while(daftar != NULL) {
                    if(daftar->bintang == '*'){
                        ip = hitung_nilai(daftar->nilai) * daftar-
>sks;
                        total_ip = total_ip + ip;
                        total_sks = total_sks + daftar->sks;
                    }
                    daftar = daftar->detail;
                }

                ipk = total_ip / total_sks;
                total_ipk = total_ipk + ipk;
                total_mhs = total_mhs + 1;
                no = no + 1;

                printf("| %2d | %s | %-28s | %4.2f |\n",
no,kursor->nim,kursor->nm_mhs,ipk);
                printf("_____________________________________________
_____________\n");
            }

            kursor=kursor->root;
        }
    }
    ipk_rata2 = total_ipk / total_mhs;
    printf("| TOTAL IPK RATA - RATA  :                              |
%4.2f |\n", ipk_rata2);
    printf("_____________________________________________________________
___\n");
}
```